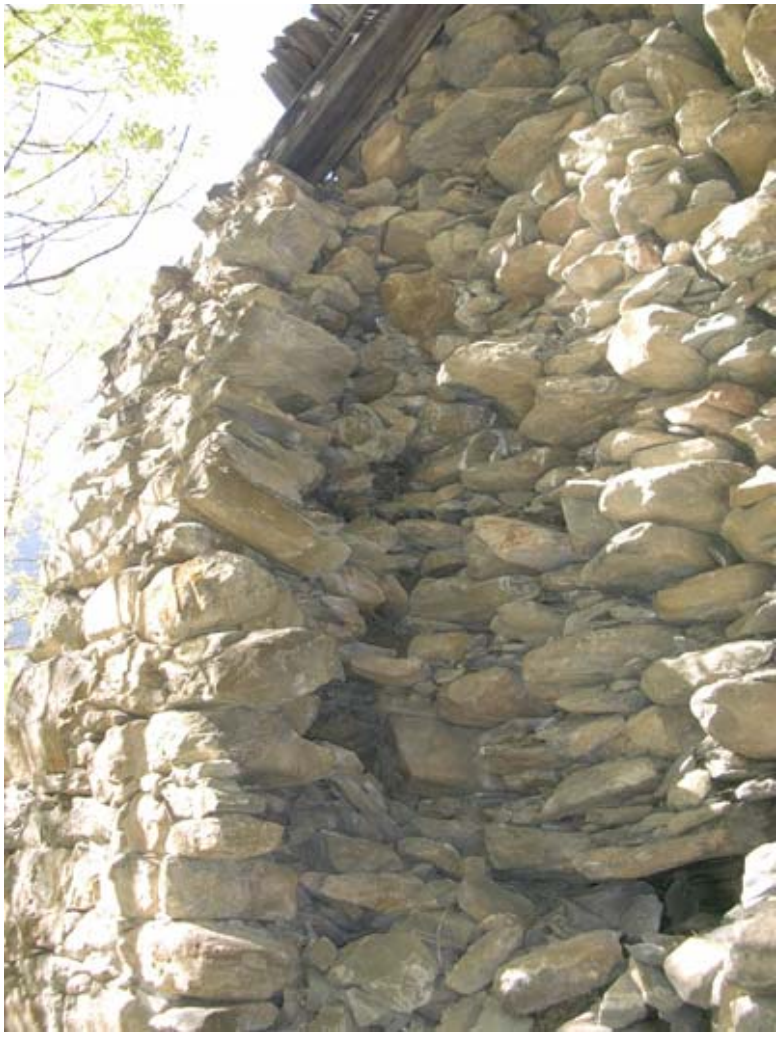
POLYTECHNIC OF TORINO
FACULTY OF ARCHITECTURE 1
Degree in Architecture
Honors theses

Damages analysis of stone walls in the region of valle d'Aosta, Italy
by Claude Lévèque and Marco Milanese
Tutor: Giuseppe Pistone

This work is about damages occurred on stone walls in the region of Valle d'Aosta. The analysis is based on the rural architecture because it is one of the most important cultural element of this region and still nowadays it is not deeply examined especially in its structural and conservative aspects. There are many books about medieval castles, abbeys and churches but no one is dedicated to the ancient houses made by stones.

The work begins with an introduction on social aspects, on the materials used to build up rural houses and the techniques applied. The insertion of a geological map gives further information about the different kind of rocks available into the border of the region. This part ends with a study of the location of the ancient lime kiln in each valley.

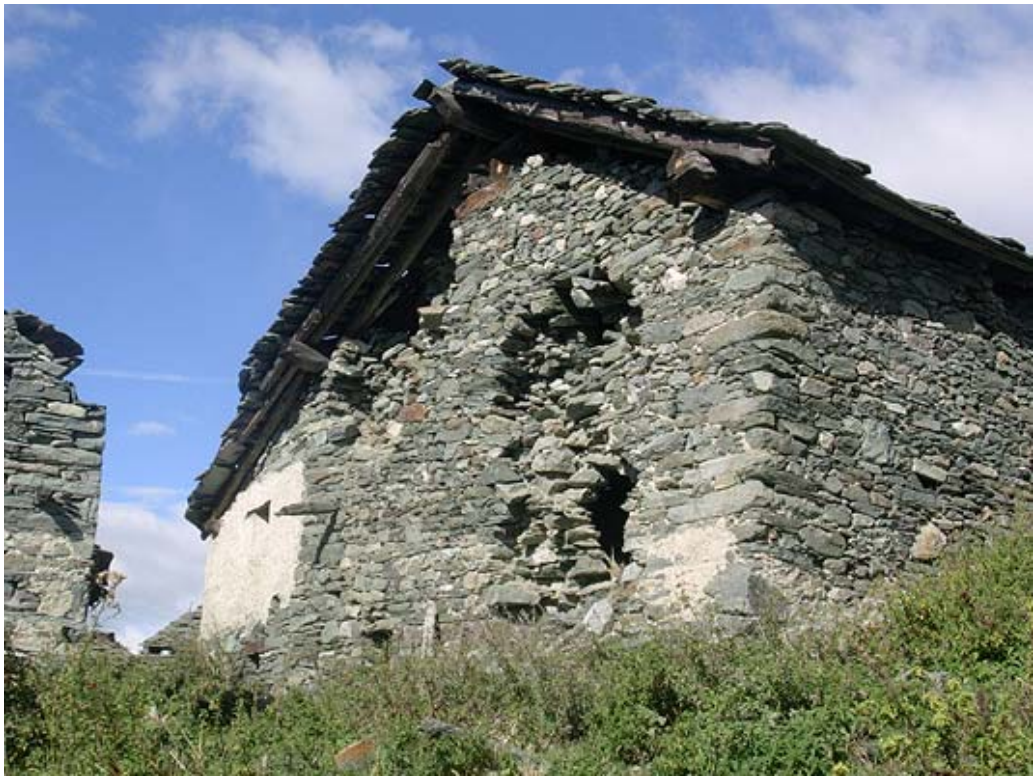


The constructional techniques are described in a logical sequence from the foundations to the roofs, including walls, windows and floors. There is also a part dedicated to the "*Rascard*" which is considered the most important example of the local architecture. It is well represented by images showing its social role, the refined techniques and the specific way of inhabiting it.

As far as structural damages is concerned, there are two different parts. The first one is about the theory of the damages which also includes some typology of phenomena strictly tied to rural buildings, while the second one is a very deep analysis of real houses. A long period has been dedicated to carry out many surveys in the land of Valle d'Aosta in order to find the best examples of damages linked to the type of wall and architectural typology.

Generally each valley requests at least one week of work, during which it was driven from the top to the bottom searching damages. The result is that the analysis includes buildings that take place all over the region also part of abandoned villages.

The next step has been the creation of schedules to give information about each examples allowing the comparison of buildings. Each schedule is characterized by the presence of many pictures, descriptions and commentaries.



The analysis of this archive is important to get conclusions about structural damages of the stone walls, giving more items about the argument. This approach allows a full study of the causes that determined damages in relation with structural techniques and materials discovered in each example. The problem of the resistance of texture in the walls stone is highlighted in this part of the work through a lot of considerations which take care of the constructive solutions: the use of lime or the lack of it, the use of a mix of clay and water are responsible of different levels of structural durability.
The subsequent creation of a numerical value underlines the scientific approach to this argument. It has the purpose of giving a precise number which represents the attitude of a building to be renovated. The numeric index is based on different items which includes also practical and economical parameters. The site and its characteristics such as its location or its reachable are really influent on the result. At the same time, the economic advantage has an important role. This approach has the precise aim of giving a practical implication.
The work ends with a chapter dedicated to explain some techniques used by the ancient builders to preserve rural houses. It includes the presence of some constructive devices to avoid any damages on stone walls. Generally they were applied both during the building yards or later.

For further information, e-mail:
Claude Lévèque: klo79@libero.it
Marco Milanese: marco.milanese@vodafone.it